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EXAMINER

NORTON, NADINE GEORGIANNA

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/042,056

Applicant(s)

LESIEUR ET AL.

Examiner

Nadine Norton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 20-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Withdrawal of Objection to Specification

Applicants' amendment submitted 4-29-03 in paper no.7 is sufficient to overcome the previous objection to the abstract.

Withdrawal of Claim Objections

Applicants' amendment submitted 4-29-03 in paper no.7 is sufficient to overcome the previous objection to the claims.

Withdrawal of Double Patenting (35 U.S.C. 101)

Applicants' abandonment of Application No. 10/076,669 overcomes the previous double patenting rejection under 35 U.S.C. 101.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8 and 20-25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Setzer et al.(3,485,746).

Applicants are claiming several methods for desulfurizing a feed which involve processing an oxygenate containing feed over a nickel desulfurization station.

The reference of Setzer et al.(3,485,746) discloses a process for desulfurizing a hydrocarbon fuel containing organic sulfur compounds such as thiophenes and mercaptans for use in a fuel cell. See column 1, lines 20-25 and column 2, lines 35-43. The disclosed process is suitable for processes that are effected by trace amounts of sulfur. See column 1, lines 22-23. The process involves adding water (steam) to a fuel and contacting the water containing fuel with nickel metal. See Fig.1, page 1, column 1, lines 62-66. The desulfurization is conducted at a temperature of 500-900°F. See column 1, lines 69-70. The nickel bed is converted to nickel sulfide. See column 3, lines 26-29. The reference further teaches that it is thought that oxygen from the steam forms a protective layer on the nickel particles, thereby preventing undesirable coke formation in the bed. See column 3, lines 32-45.

The reference of Setzer et al.(3,485,746) succeeds in disclosing a process for desulfurizing a fuel suitable for use in fuel cells. The reference succeeds at disclosing the addition of an oxygenate in the form of water. In addition, the reference succeeds in disclosing a nickel reactant-absorbent for converting organic sulfur compounds to nickel sulfide which is considered to correspond to applicants' desulfurization station.

Several differences are noted between the reference of Setzer et al.(3,485,746) and applicants' claimed invention. The reference is silent about the process effluent containing less

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than 0.05 ppm sulfur. The reference does not disclose maintaining the desulfurization station (nickel bed) at a temperature in the range of 300-450°F. The reference is also silent about the recirculating of water. The reference is silent about the processing of the specific gaseous feed claimed by applicants.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to desulfurize the Setzer et al.(3,485,746) fuel to any degree required to produce a suitable fuel cell feed, including applicants' less than 0.05 ppm sulfur, because the reference discloses that the method is desirable for sensitive processes which are affected by trace quantities of sulfur. It is within the level of ordinary skill to practice a known desulfurization process to attain a desired level of desulfurization.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to accomplish the desulfurization of Setzer et al.(3,485,746) at a temperature of 450°F because the prior art range is close enough that one skilled in the art would have expected it to have the same conversion properties including sulfur removal ability. Applicants have not shown anything unexpected with respect to the claimed temperatures.

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize water obtained from any source in the Setzer et al.(3,485,746), including a recycle from a selective oxidizer output, because the water composition is the same regardless of the source. It is within the level of ordinary skill in the art to recycle in a known process.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to process any feed applicable to a fuel cell according to the process of Setzer et

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al.(3,485,746) , including applicants' specific gaseous feeds because the reference of Setzer et al.(3,485,746) does not limit the specific hydrocarbon feeds. In the absence of unexpected results, any hydrocarbon fuel suitable for use in a fuel cell would be expected to be suitable for treatment in the Setzer et al.(3,485,746) process.

Claim Rejections - 35 USC § 103

Claims 9-11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Setzer et al.(3,485,746) in view of Alexander et al.(6,103,103).

See teachings of Setzer et al.(3,485,746) and statements of obviousness above.

Several additional differences are noted between the reference of Alexander et al.(6,103,103) and applicants' claimed invention. Setzer et al.(3,485,746) does not disclose alcohol or ether oxygenates. It is also noted that the reference of Setzer et al.(3,485,746) does not disclose the production of isobutylene and methanol products.

The reference of Alexander et al.(6,103,103) is cited to show that conventional gasoline marketed in large metropolitan areas contains oxygenates including, methanol, ethanol and MTBE (methyl tertiary butyl ether). See column 1, lines 1-25. Such compounds are known to have high blending octanes. See column 1, lines 26-28.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to treat a fuel containing oxygenates such as methanol, ethanol or MTBE (methyl tertiary butyl ether) according to the Setzer et al.(3,485,746) because Alexander et al.(6,103,103) illustrates that it is conventional for such fuels to contain oxygenates which are known to desirably have high blending octanes. Motivation to include oxygenates in the fuel is derived

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from the fact that such oxygenate additives have high blending octanes (note: high octane indicates a high resistance to undesirable knock). One of ordinary skill desiring to reduce knock would add such oxygenates to fuel which are known to improve octane. In addition, applicants' methanol/isobutylene production limitations are not considered to be patentable distinctions because the formation of isobutylene or methanol would naturally result from processing a feed containing the oxygenates of Alexander et al.(6,103,103) over the nickel catalyst of Setzer et al.(3,485,746).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2, 4-11 and 20-25 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 of copending Application No. 10/076,670. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to a process of desulfurizing a feed which contains an oxygenate.

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Several differences are noted between the present claims and the claims of application 10/076,670. The present claims produce a fuel which is suitable for use in a fuel power plant whereas the claims of 10/076,670 prepare a fuel which is suitable for use in an internal combustion engine. In addition, the claims of 10/076,670 include several limitations directed at processing a "diesel" fuel whereas the present claims do not. Furthermore, 10/076,670 does not disclose introducing water mixed with a gasoline into the nickel desulfurization station, wherein the water is obtained by recirculating a portion of a selective oxidizer output.

Applicants' preamble limitation pertaining to a fuel suitable for use in a fuel cell power plant is not considered to be a patentable distinction over the claims of 10/076,670 because it does not further define the "process" steps. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the desulfurized fuel produced by the claims of 10/076,670 for any new purpose, including in a fuel cell plant, because it has been held that the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make a claim patentable. See In re Best, Bolton and Shaw, 195 USPQ 430, 433 (CCPA 1977).

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to treat any hydrocarbon fuel containing undesirable sulfur and oxygenates, including a diesel fuel, because the present claims do not limit the types of fuels containing sulfur and oxygenates. In the absence of unexpected results, any fuel containing sulfur and oxygenates could be processed according to the present claims.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize water obtained from any source in the claims of 10/076,670, including a

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recycle from a selective oxidizer output, because the water composition is the same regardless of the source. It is within the level of ordinary skill in the art to recycle in a known process.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1-2, 4-11 and 20-25 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of U.S. Patent No. 6,533,924. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to a process of desulfurizing a feed which contains an oxygenate.

Several differences are noted between the present claims and the claims of U.S. Patent No. 6,533,924. The present claims produce a fuel which is suitable for use in a fuel power plant whereas the claims of U.S. Patent No. 6,533,924 prepare a fuel which is suitable for use in an internal combustion engine. Furthermore, U.S. Patent No. 6,533,924 does not disclose introducing water mixed with a gasoline into the nickel desulfurization station, wherein the water is obtained by recirculating a portion of a selective oxidizer output.

Applicants' preamble limitation pertaining to a fuel suitable for use in a fuel cell power plant is not considered to be a patentable distinction over the claims of U.S. Patent No. 6,533,924 because it does not further define the "process" steps. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the desulfurized fuel produced by the claims of U.S. Patent No. 6,533,924 for any new purpose, including in a fuel cell plant, because it has been held that the claiming of a new use, new function, or unknown

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property which is inherently present in the prior art does not necessarily make a claim patentable.

See In re Best, Bolton and Shaw, 195 USPQ 430, 433 (CCPA 1977).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize water obtained from any source in the claims U.S. Patent No. 6,533,924, including a recycle from a selective oxidizer output, because the water composition is the same regardless of the source. It is within the level of ordinary skill in the art to recycle in a known process.

Claims 1, 2, 4-8 and 21-23 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3 of U.S. Patent No. 6,454,935. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are directed at a process for sulfur removal.

Several differences are noted between applicants' claims and the claims of U.S. Patent No. 6,454,935. The claims of U.S. Patent No. 6,454,935 include limitations directed at water being consumed during the desulfurization step whereas applicants' pending claims do not. In addition, several of applicant's claims are broadly directed at the treatment of a hydrocarbon fuel whereas the claims of U.S. Patent No. 6,454,935 are limited to the treatment of a gasoline fuel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made that the process of applicants' present claims would similarly consume water because the same water containing feed is contacted with the same nickel composition that is responsible for the water consumption.

It would be obvious to one of ordinary skill in the art at the time the invention was made to select gasoline as the hydrocarbon fuel in applicant's pending claims because gasoline is a known fuel for a fuel cell power plant.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Response to Arguments

Applicants' arguments filed 4-29-03 have been fully considered but they are not persuasive.

Applicants' additional arguments asserting that the disclosure of Setzer et al. does not encompass applicants' "no more than about 0.05 ppm sulfur" are not persuasive. It is maintained that the reference's disclosure of "amounts below those amounts detectable" and encompass applicants' 0.05 ppm. Applicants' sulfur amounts are considered to overlap those disclosed by Setzer et al. (See previous arguments of record). Applicants have not pointed to any difference in the process of Setzer et al. that would produce a level of desulfurization different from that claimed by applicants. Since the reference suggests attaining sulfur amounts overlapping those claimed by applicants, it is not necessary that the examiner set forth specific modifications to achieve such amounts.

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Applicants' arguments asserting that Setzer et al. discloses 500-900°F as the only operating range are not persuasive in overcoming the pending rejection. It is still maintained that the reference's disclosure of "elevated temperature" is a broad disclosure and that 500-900°F is a preferred embodiment which does not limit the disclosure of the reference. One of ordinary skill would be motivated to select a specific elevated temperature which accomplishes a desired level of desulfurization, such as the specific temperature claimed by applicants. Also, the preferred temperature range of Setzer et al. is close enough to the temperature claimed by applicants that similar sulfur removal conversion would occur. Applicants have not shown anything unexpected by employing the specifically claimed elevated temperature.

In response to applicants' request for clarification, the phrase "the same properties" in the rejection above is intended to refer to process conversion properties including the ability of the process to remove sulfur.

Applicants' arguments directed at overcoming the combination of Setzer et al. with the secondary reference of Alexander et al. are not persuasive. Applicants are relying on different portions of Alexander et al. than those relied on in the rejection above to destroy the combination of references. It is maintained that the secondary reference of Alexander was relied on for the teaching in its prior art section that oxygenates are known fuel additives (e.g. enhancers). The fact that the secondary reference teaches an alternative to such enhancers does not negate the general teaching that such oxygenate additives are known. One of ordinary skill in the art would be motivated to add applicants' claimed oxygenates to the fuel of Setzer et al.(4,485,746) because such oxygenates are known to improve fuel octane as evidenced by the secondary

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reference. Motivation to add applicants' claimed oxygenates is derived from the desire to obtain the known benefits of such additives (e.g. a high octane fuel).

In addition, the double patenting rejection over U.S. Application No. 09/512,035 is converted to a double patenting rejection over U.S. Pat. No. 6,533,924 (the patent of application 09/512,035).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Norton whose telephone number is 703-305-2667. The examiner can normally be reached on Monday through Thursday from 8:30 am to 7:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

N.N.

July 1, 2003

NADINE G. NORTON
PRIMARY EXAMINER

